

CLAIMS

What is claimed is:

1. A method of fabricating an electrostatic actuator,
comprising:

5 forming an electrode on a substrate;
 forming a support layer over the electrode; and
 depositing a metal layer onto the support layer, while
varying deposition process conditions in order to induce a
stress gradient into the metal layer.

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2. The method of claim 1, further comprising removing the
support layer to form a gap between the metal layer and the
electrode.

15 3. The method of claim 1, wherein the support layer is a
photoresist.

4. The method of claim 1, further comprising forming an anchor
on the substrate, wherein one end of the metal layer is
20 deposited on the anchor.

5. The method of claim 1, further comprising the step of
increasing the deposition rate during deposition of the metal
layer in order to induce a stress gradient in the metal layer.

6. The method of claim 1, further comprising the step of lowering the deposition temperature during deposition of the metal layer in order to induce a stress gradient in the metal layer.

7. The method of claim 1, wherein electroplating is used to deposit the metal layer.

8. The method of claim 7 further comprising the step of increasing the electroplate current density during deposition of the metal layer in order to induce a stress gradient in the metal layer.

9. The method of claim 7, further comprising the step of lowering the electroplate temperature during deposition of the metal layer in order to induce a stress gradient in the metal layer.

10. The method of claim 1, wherein the step of depositing the metal layer further comprising the steps of:

depositing a soft metal; and

depositing a hard metal onto the deposited soft metal layer, wherein the deposited soft metal and the deposited hard

metal are made substantially of the same metal characterized by different crystal grain sizes and the deposited hard metal exhibits a higher intrinsic stress than the deposited soft metal.

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11. The method of claim 10, wherein the deposited soft metal and the deposited hard metal are substantially gold.

12. The method of claim 10, wherein the deposited soft metal
10 and the deposited hard metal are substantially silver.

13. The method of claim 10, wherein the hard metal is deposited in an electroplating bath containing dopants to enhance the intrinsic stress of the hard metal.

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14. The method of claim 10, wherein the hard metal is deposited at a higher electroplate current density than the soft metal.

15. The method of claim 10, wherein the hard metal is deposited
20 at a lower electroplate temperature than the soft metal.